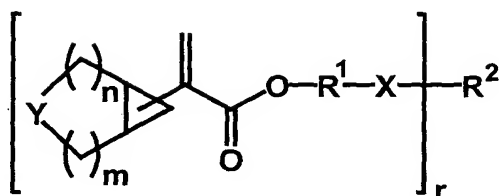


Patent claims

1. A bicyclic cyclopropane derivative of the general Formula (I)



Formel I

in which R^1 , R^2 , X , Y , n , m and r , independently of one another, have the following meanings:

$n+m$ = 0 to 8;

r = 1 to 4;

R^1 = is absent, or a C_1 - C_{20} alkylene radical which can be interrupted by O or S, a cycloaliphatic C_4 - C_{12} radical, a bicyclic C_4 - C_{12} radical, a C_6 - C_{14} arylene or C_7 - C_{20} alkylenearylene radical;

R^2 is for $r = 1$: a C_1 - C_{20} alkyl radical which can be interrupted by O or S, a cycloaliphatic C_4 - C_{12} radical, a bicyclic C_4 - C_{12} radical, a C_6 - C_{14} aryl or C_7 - C_{20} alkylaryl radical;

for $r > 1$: an r -times substituted aliphatic C_1 to C_{20} radical which can be interrupted by O or S, a cycloaliphatic C_4 - C_{12} radical, an aromatic C_6 - C_{14} radical or aliphatic-aromatic C_7 - C_{20} radical;

X = is absent, $-\text{CO}-\text{O}-$, $-\text{CO}-\text{NH}-$ or $-\text{O}-\text{CO}-\text{NH}-$ and

Y = CH_2 , O or S.

2. A bicyclic cyclopropane derivative according to claim 1, characterized in that at least one variable of the Formula (I) has one of the following meanings:

$n+m$ = 1 to 5;

r = 1 to 3;

R^1 = is absent, or a C_1 - C_{10} alkylene radical which can be interrupted by O, cyclohexylene, a bicyclic C_6 - C_9 radical, phenylene or a C_7 - C_{10} alkylenearylene radical;

R^2 is for $r = 1$: a C_1 - C_6 alkyl radical which can be interrupted by O, a cycloaliphatic or bicyclic C_6 - C_8 radical, a C_6 - C_{10} aryl or C_7 - C_{10} alkylaryl radical;

for $r > 1$: an r -times substituted aliphatic C_1 to C_{12} radical which can be interrupted by O, a cycloaliphatic C_5 - C_7 radical, an aromatic C_6 - C_{10} radical or aliphatic-aromatic C_7 - C_{10} radical;

X = is absent, $-\text{CO}-\text{O}-$ or $-\text{O}-\text{CO}-\text{NH}-$ and

Y = CH_2 or O.

3. A bicyclic cyclopropane derivative according to claim 1 or 2, **characterized in that** at least one variable of the Formula (I) has one of the following meanings:

$n+m$ = 2 or 3;

r = 1 or 2;

R^1 = is absent, a $-(\text{CH}_2)_{1-4}-$ radical which can be interrupted by O, cyclohexylene or phenylene;

R^2 is for $r = 1$: a C_1 - C_4 alkyl radical which can be interrupted by a O, cyclohexyl, bicyclo[2.2.1]heptyl or;

for $r > 1$: an r -times substituted aliphatic C_2 to C_6 radical, an r -valent cyclohexane radical or an r -valent benzene radical;

X = is absent or $-\text{CO}-\text{O}-$ and

Y = CH_2 .

4. A bicyclic cyclopropane derivative according to one of claims 1 to 3, **characterized in that** r is equal to 1 and R^2 is unsubstituted or substituted by alkyl, halogen, OCH_3 , OC_2H_5 , vinyl, propenyl, (meth)acryl, COOR^3 , SiCl_3 , $\text{Si}(\text{OR}^4)_3$, or a mesogenic group, with $R^3 = \text{H}$, a C_1 to C_{10} alkyl or a phenyl radical and $R^4 = \text{H}$ or a C_1 to C_{10} alkyl radical.

5. A bicyclic cyclopropane derivative according to one of claims 1 to 4, **characterized in that**, r is greater than 1 and R^2 is unsubstituted or substituted by alkyl, halogen, OCH_3 , OC_2H_5 , vinyl, propenyl, (meth)acryl, $CO-OR^3$ or a mesogenic group, with $R^3 = H$ or C_1 to C_{10} alkyl or a phenyl radical.
6. A composition, characterized in that it contains a bicyclic cyclopropane derivative according to one of claims 1 to 5.
7. A composition according to claim 6, **characterized in that** it additionally contains an initiator for radical polymerization.
8. A composition according to claim 6 or 7, **characterized in that** it additionally contains a radically polymerizable monomer.
9. A composition according to one of claims 6 to 8, **characterized in that** it contains a monofunctional and/or a multifunctional radically polymerizable monomer.
10. A composition according to claim 9, **characterized in that** it contains, as monofunctional radically polymerizable monomer, a urethane from 2-(hydroxymethyl)acrylic acid ethyl ester and a diisocyanate such as 2,2,4-trimethylhexamethylene diisocyanate or isophorone diisocyanate, a crosslinking pyrrolidone such as 1,6-bis(3-vinyl-2-pyrrolidonyl)-hexane, a bisacrylamide such as methylene or ethylene bisacrylamide, a bis(meth)acrylamide such as N,N' -diethyl-1,3-bis(acrylamido)-propane, 1,3-bis(methacrylamido)-propane, 1,4-bis(acrylamido)-butane or N,N' -bis-(acryloyl)-piperazine, or a mixture of two or more of these monomers.

11. A composition according to claim 9 or 10, **characterized in that** it contains, as multifunctional radically polymerizable monomer, a bi- or multifunctional acrylate or methacrylate such as Bisphenol-A-di(meth)acrylate, bis-GMA (an addition product of methacrylic acid and Bisphenol-A-diglycidylether), UDMA (an addition product of hydroxyethyl methacrylate and 2,2,4-trimethylhexamethylene diisocyanate), di-, tri- or tetraethylene glycol di(meth)acrylate, decanediol di(meth)acrylate, trimethylolpropane tri(meth)acrylate, pentaerythritol tetra(meth)acrylate, butanediol di(meth)acrylate, 1,10-decanediol di(meth)acrylate, 1,12-dodecandiol di(meth)acrylate or a mixture of two or more of these monomers.
12. A composition according to one of claims 6 to 11, **characterized in that** it additionally contains filler.
13. A composition according to one of claims 4 to 13, **characterized in that** it contains
 - a) 1 to 95 wt.-% bicyclic cyclopropane derivative according to one of claims 1 to 5;
 - b) 0.01 to 5 wt.-% initiator for radical polymerization; and
 - c) 0 to 94 wt.-% radically polymerizable monomer.
14. A composition according to claim 13, **characterized in that** it contains
 - a) 1 to 80 wt.-% bicyclic cyclopropane derivative according to one of claims 1 to 5;
 - b) 0.01 to 5 wt.-% initiator for radical polymerization
 - c) 0 to 60 wt.-% radically polymerizable monomer;
 - d) 0 to 20 wt.-% filler;and/or
 - e) 0 to 40 wt.-% solvent.

15. Composition according to claim 13, **characterized in that** it contains
 - a) 1 to 60 wt.-% bicyclic cyclopropane derivative according to one of claims 1 to 5;
 - b) 0.01 to 5 wt.-% initiator for radical polymerization
 - c) 0 to 60 wt.-% radically polymerizable monomer;and/or
 - d) 20 to 60 wt.-% filler.
16. Composition according to claim 13, **characterized in that** it contains
 - a) 1 to 45 wt.-% bicyclic cyclopropane derivative according to one of claims 1 to 5;
 - b) 0.01 to 5 wt.-% initiator for radical polymerization
 - c) 0 to 50 wt.-% radically polymerizable monomer;and/or
 - d) 30 to 85 wt.-% filler.
17. Composition according to claim 13, **characterized in that** it contains
 - a) 1 to 95 wt.-% bicyclic cyclopropane derivative according to one of claims 1 to 5;
 - b) 0.01 to 5 wt.-% initiator for radical polymerization
 - c) 0 to 60 wt.-% radical polymerizable monomer;and/or
 - d) 0 to 20 wt.-% filler.
18. Use of a bicyclic cyclopropane derivative according to one of claims 1 to 5 for the preparation of a dental material.
19. Use of a composition according to one of claims 5 to 17 as dental material.
20. Use of a composition according to claim 14 as adhesive.
21. Use of a composition according to claim 15 as cement.

22. Use of a composition according to claim 16 as filling material.
23. Use of a composition according to claim 17 as coating material.